

<b>SPECIES: Scientific [common]</b>	<i>Phacelia lyallii</i> (Lyall's phacelia)
<b>Forest:</b>	Salmon–Challis National Forest
<b>Forest Reviewer:</b>	<b>Jessica M Dhaemers; Brittni Brown; John Proctor</b>
<b>Date of Review:</b>	<b>10/12/2017; 16 February 2018; 19 March 2018</b>
<b>Forest concurrence (or recommendation if new) for inclusion of species on list of potential SCC: (Enter Yes or No)</b>	<b>YES</b>

**FOREST REVIEW RESULTS:**

1. The Forest concurs or recommends the species for inclusion on the list of potential SCC:  
Yes X No \_\_\_
2. Rationale for not concurring is based on (check all that apply):  
Species is not native to the plan area \_\_\_\_\_  
Species is not known to occur in the plan area \_\_\_\_\_  
Species persistence in the plan area is not of substantial concern \_\_\_\_\_

**FOREST REVIEW INFORMATION:**

1. Is the Species Native to the Plan Area? Yes X No \_\_\_  
  
If no, provide explanation and stop assessment.
2. Is the Species Known to Occur within the Planning Area? Yes X No \_\_\_  
  
If no, stop assessment.

**Table 1.** All Known Occurrences, Years, and Frequency within the Planning Area

<b>Year Observed</b>	<b>Number of Individuals</b>	<b>Location of Observations (USFS District, Town, River, Road Intersection, HUC, etc.)</b>	<b>Source of Information</b>
1990	15	Along the Continental Divide in the Beaverhead Mountains; ca 0.5 air mi southwest of Berry Lake (Montana).  Leadore Ranger District	IDFG Element Occurrence EO Number: 5 EO_ID: 3793
1990	3	Continental Divide in the Beaverhead Range; ridge above (west of) Skytop Lake and Highup Lake (Montana).  Leadore Ranger District	IDFG Element Occurrence EO Number: 1 EO_ID: 286

Year Observed	Number of Individuals	Location of Observations (USFS District, Town, River, Road Intersection, HUC, etc.)	Source of Information
1990	100	Along the Continental Divide in the Beaverhead Mountains, on ridge W of Timberline Lake (Montana).  Leadore Ranger District	IDFG Element Occurrence EO Number: 6 EO_ID: 276
1984	Common	Summit of Peak 9992, Continental Divide, head of Freeman Creek, Beaverhead Mountains.  North Fork Ranger District	IDFG Element Occurrence EO Number: 3 EO_ID: 4666
1990	101-1,000	North face of Pyramid Peak on the Continental Divide.  North Fork Ranger District	IDFG Element Occurrence EO Number: 7 EO_ID: 4015
1974	No data	10 m NW of saddle between the East Fork Hayden Creek and Mill Creek, S of Mill Mountain in the Lemhi Range.  Leadore Ranger District	IDFG Element Occurrence EO Number: 4 EO_ID: 941

a. Are all Species Occurrences Only Accidental or Transient?

Yes \_\_\_ No X

If yes, document source for determination and stop assessment.

b. For species with known occurrences on the Forest since 1990, based on the number of observations and/or year of last observation, can the species be presumed to be established or becoming established in the plan area?

Yes X No \_\_\_

If no, provide explanation and stop assessment

c. For species with known occurrences on the Forest predating 1990, does the weight of evidence suggest the species still occurs in the plan area?

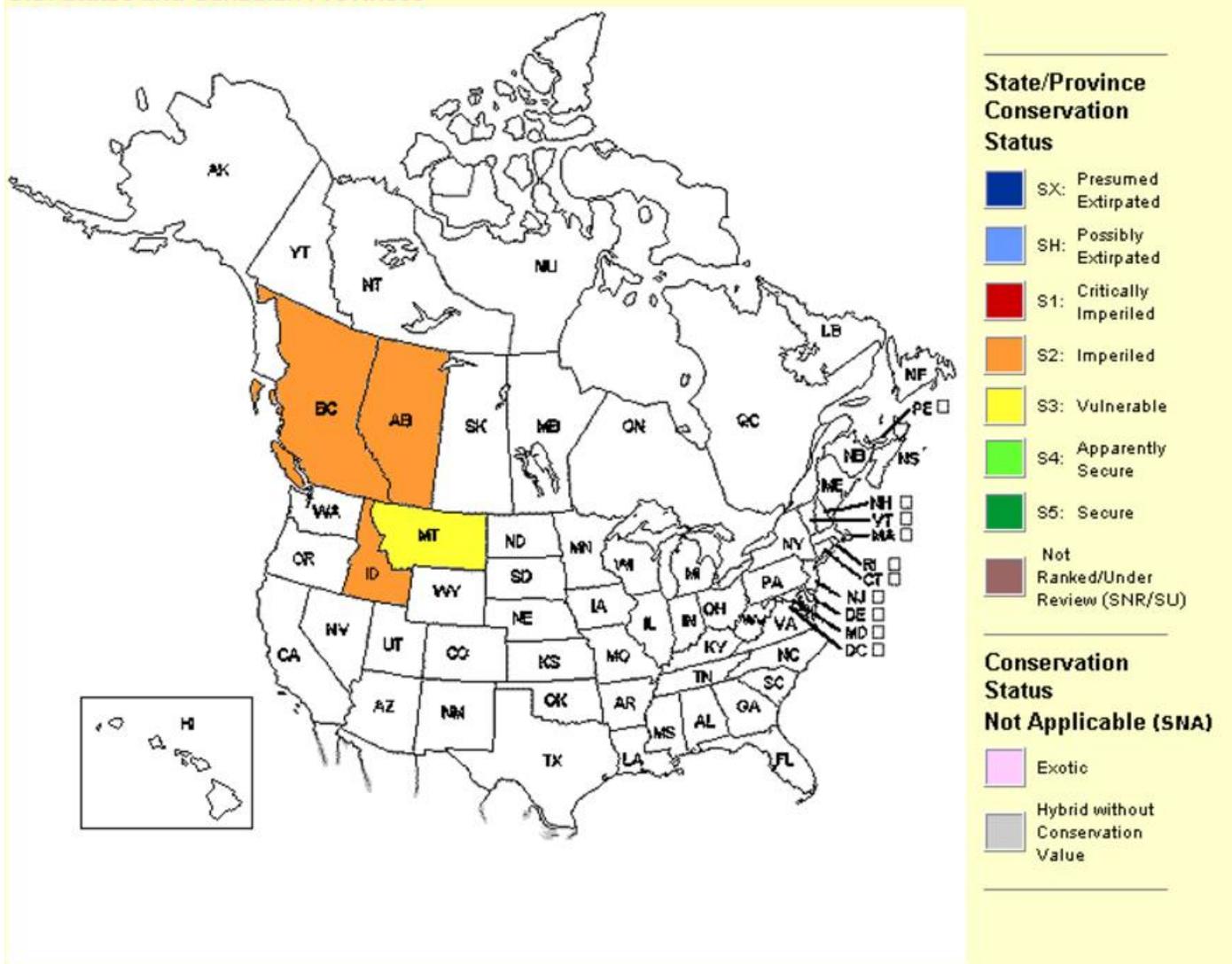
Yes X No \_\_\_

Provide explanation for determination

If determination is no, stop assessment

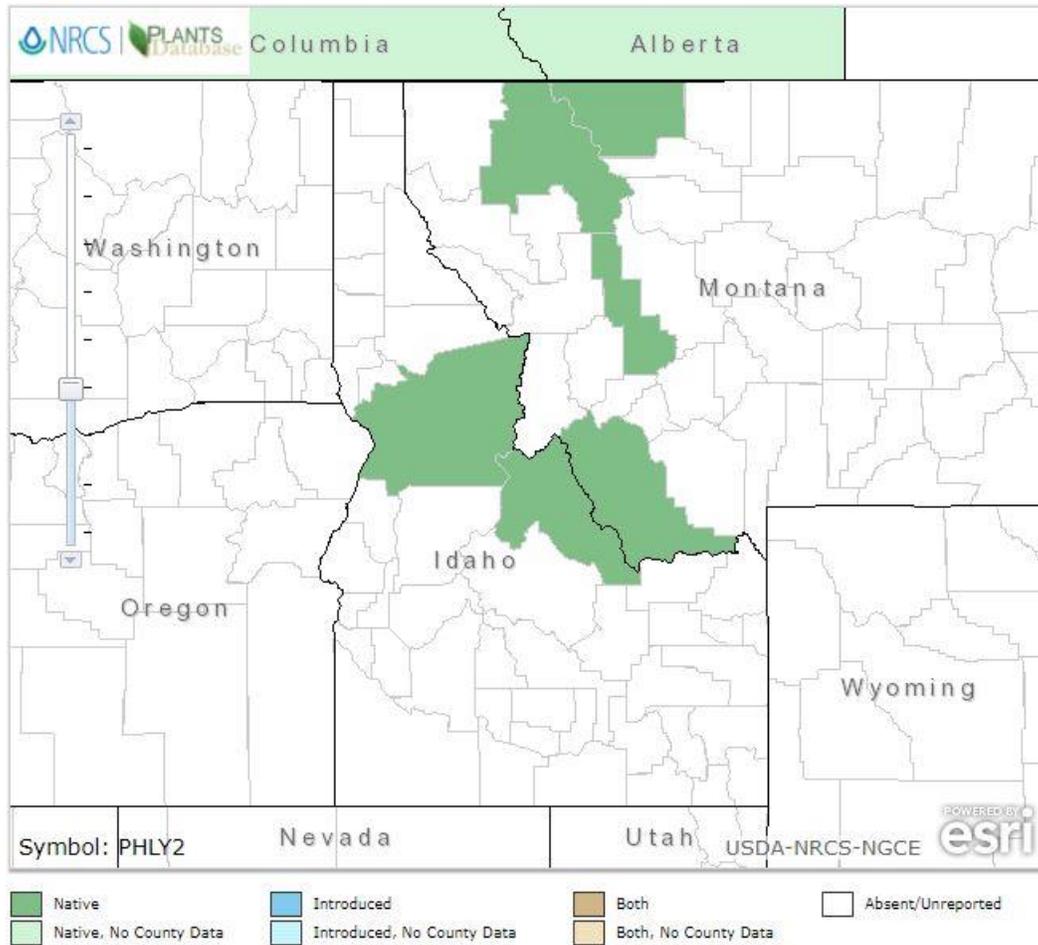
d. **Map 1**, Lyall's phacelia conservation status in US and Canada (NatureServe 2017)

**U.S. States and Canadian Provinces**



NatureServe. 2017. Conservation Species Report. *Phacelia lyallii*. Internet website: <http://explorer.natureserve.org>. Accessed on September 22, 2017.

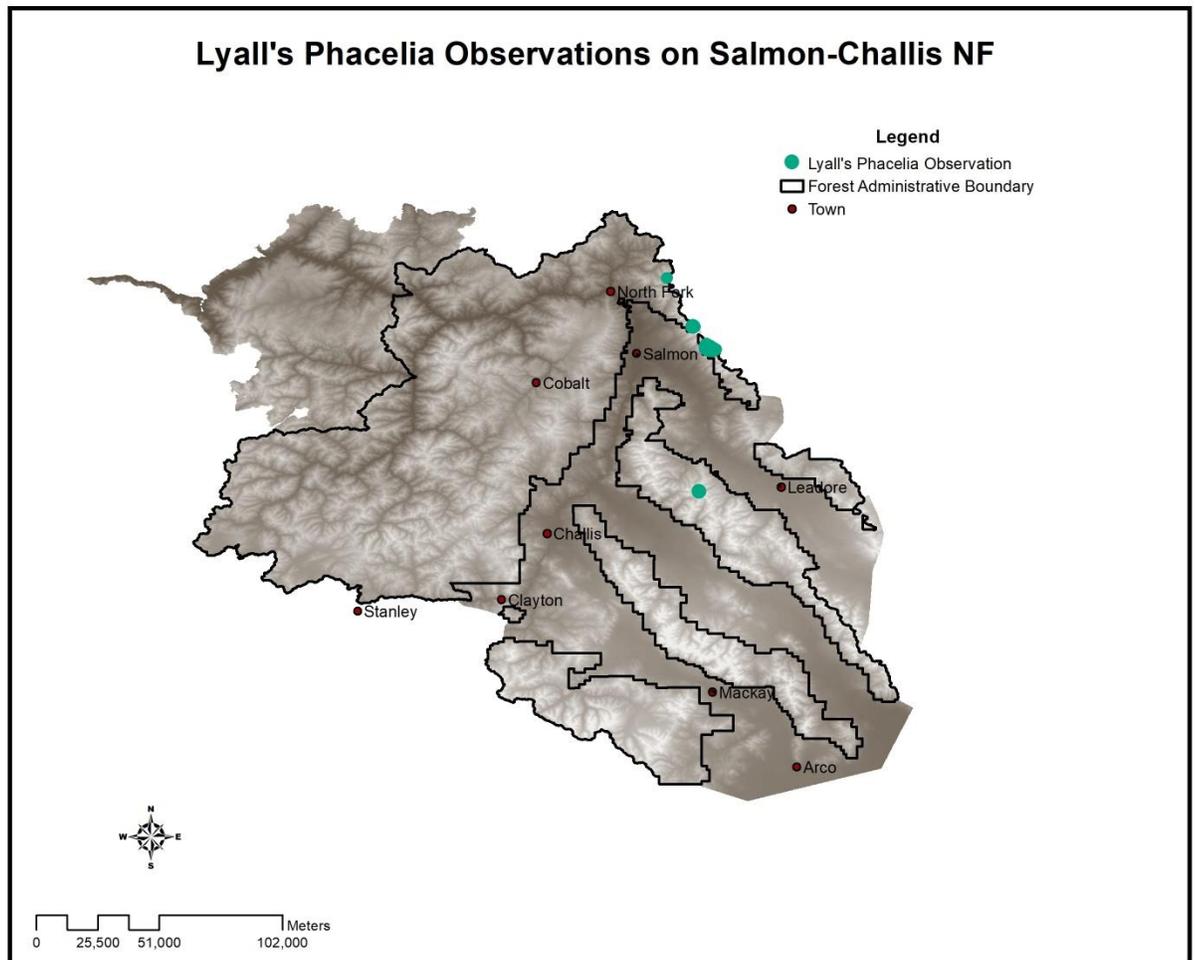
e. **Map 2**, Lyall's phacelia range in Idaho and surrounding states and provinces (NRCS 2017)



USDA. 2017. Plants Profile for *Phacelia lyallii*. Internet website:

<https://plants.usda.gov/core/profile?symbol=PHLY2#>. Accessed on September 22, 2017.

- f. **Map 3**, Lyall's phacelia observations on the Salmon–Challis National Forest (IDFG. 2017. Idaho Fish and Wildlife Information System, Species Diversity Database, Idaho Natural Heritage Data. Accessed February 27, 2017.)



September 13, 2017



3. Is There Substantial Concern for the Species' Capability to persist Over the Long-term in the Plan Area Based on Best Available Scientific Information?

**Table 2.** Status summary based on existing conservation assessments

<b>Entity</b>	<b>Status/Rank (include definition if Other)</b>
Global Rank	G3– Vulnerable (Rare or uncommon but not imperiled [typically 21 to 100 occurrences]) <sup>1</sup>
State Rank	S2– Imperiled (typically having 6 to 20 occurrences, or 1,001 to 3,000 individuals) <sup>1</sup>
USDA Forest Service	Region 1: Not listed <sup>2</sup> Region 4: Not listed <sup>3</sup>
USDI FWS	Not listed as a candidate species <sup>4</sup>
Other	Idaho Native Plant Society: 2016 – on list, not yet ranked <sup>5</sup> ; 2011 – State Sensitive (Taxa with small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized without active management or removal of threats) <sup>6</sup>  BLM: Not listed <sup>7</sup>

1. Idaho Natural Heritage Program. 2016. IDNHP Tracked Plant Species 2016. On file. Accessed January 12, 2018
2. USFS Region 1. 2011. 2011 Sensitive Species List Idaho and Montana. Website: <http://fsweb.r1.fs.fed.us/wildlife/wwfrp/TEsnew.htm>. Accessed January 10, 2017.
3. USFS Region 4. 2016. Proposed, Endangered, Threatened, and Sensitive Species List. On file. Accessed January 11, 2017.
4. USFWS. 2017. Candidate species believed to or known to occur in Idaho. Website: <https://ecos.fws.gov/ecp0/reports/species-listed-by-state-report?state=ID&status=candidate>. Accessed January 12, 2018.
5. Idaho Native Plant Society. 2016. INPS Rare Plant List May 2016. <https://idahonativeplants.org/rare-plants-list/> Accessed January 10, 2018.
6. Idaho Native Plant Society. 2011. Results of the twenty-fifth Idaho Rare Plant Conference – The Idaho Native Plant Society rare plant list. Website: [https://idahonativeplants.org/rpc/pdf/2011\\_Results\\_IRPC\\_v2.2.pdf](https://idahonativeplants.org/rpc/pdf/2011_Results_IRPC_v2.2.pdf). Accessed on January 11, 2018.
7. BLM. 2016. Bureau of Land Management Idaho Special Status Plants List Aug 2016. On file. Accessed 15 January, 2018.

**Table 3.** Status summary based on best available scientific information.

Species (Scientific and Common Name): *Phacelia lyallii* (Lyll's phacelia)

Criteria	Rank	Rationale	Literature Citations
<p>1 Distribution on Salmon–Challis National Forest</p>	<p>A3</p>	<p>This species is known from six occurrences on SCNF (IDFG 2017). Five occurrences are along the Continental Divide and one occurrence is in the Lemhi Range. The Lemhi Range population, discovered in 1974 is near Mill Mountain. Along the Continental Divide this species is sporadically distributed in the Beaverhead Mountains from Sheep Mountain, on the north, to Skytop Lake, on the south. Surveys for this species in 1990 concluded that this species is indeed rare. Despite extensive surveys in the Lemhi, Beaverhead, and Salmon River Mountains, the range of this species was not significantly extended (Moseley et al. 1990).</p> <p>Habitat for this species is naturally distributed as isolated patches and there is limited opportunity for dispersal among patches (Rank A3). Confidence in this rank is high as all occurrences are mapped as ridgetop populations near mountain summits.</p> <p>Confidence in Rank: <b>High</b>, Medium, or Low</p>	<p>Idaho Department of Fish and Game. 2017. Idaho Fish and Wildlife Information System, Species Diversity Database, Idaho Natural Heritage Data. Accessed on February 27, 2017.</p> <p>Robert K. Moseley, Michael Mancuso and Steven L. Caicco. 1990. Field investigations of two sensitive plant species on the Salmon National Forest: <i>Phacelia lyallii</i> and <i>Physaria didymocarpa</i> var. <i>lyrata</i>. Internet website: <a href="https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf">https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf</a>. Accessed on September 22, 2017.</p>
<p>2 Distribution in surrounding geographic area</p>	<p>C</p>	<p>This species is known from extreme southeastern British Columbia, east to southwestern Alberta and south to Montana with a few locations in Lemhi County, in east-central Idaho (NatureServe 2017). This species is rare in Idaho but relatively common in the mountains of western Montana (MNHP 2017).</p> <p>This species has a wide distribution outside of SCNF (Rank C). Confidence in this rank is high as there are multiple documented populations outside the Forest.</p> <p>Confidence in Rank: <b>High</b>, Medium, or Low</p>	<p>Montana Natural Heritage Program (MNHP). 2017. Lyall Phacelia — <i>Phacelia lyallii</i>. Montana Field Guide. Montana Natural Heritage Program. Internet website: <a href="http://fieldguide.mt.gov/speciesDetail.aspx?elcode=PDHYD0C2T0">http://fieldguide.mt.gov/speciesDetail.aspx?elcode=PDHYD0C2T0</a>. Accessed on September 25, 2017.</p> <p>NatureServe. 2017. Comprehensive Report Species. Internet website: <a href="http://explorer.natureserve.org/servlet/NatureServe?searchName=Phacelia%20lyallii">http://explorer.natureserve.org/servlet/NatureServe?searchName=Phacelia%20lyallii</a>. Accessed on September 25,</p>

Species (Scientific and Common Name): *Phacelia lyallii* (Lyll's phacelia)

Criteria	Rank	Rationale	Literature Citations
<p>3 Dispersal Capability</p>	<p>A</p>	<p>The life history of a plant may also influence the importance of dispersal capabilities. As a perennial species, <i>P. lyallii</i> would likely be less dependent upon a successful dispersal event than an annual species. Specific methods through which this species disperses have not been studied but likely include dispersal by wind, water, animals, and gravity (Moseley et al. 1990).</p> <p>This species has a very limited dispersal capability as it likely only disperses through suitable habitat which is only available for short periods each year (Rank A). Confidence in this rank is medium as dispersal mechanisms for this species have not been well studied.</p> <p>Confidence in Rank: High, <b>Medium</b>, or Low</p>	<p>2017.</p> <p>Robert K. Moseley, Michael Mancuso and Steven L. Caicco. 1990. Field investigations of two sensitive plant species on the Salmon National Forest: <i>Phacelia lyallii</i> and <i>Physaria didymocarpa</i> var. <i>lyrata</i>. Internet website:  <a href="https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf">https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf</a>.            Accessed on September 22, 2017.</p>
<p>4 Abundance on the Salmon–Challis National Forest</p>	<p>A</p>	<p>This species is known from six populations on SCNF which support less than 2,000 individuals (Moseley et al. 1990). In 1990, the Beaverhead Mountains, Lemhi Range, and Salmon River Mountains were searched extensively for this species (Moseley et al. 1990). The results of the 1990 surveys found only three new populations and these only in the Beaverhead Mountains (Moseley et al. 1990).</p> <p>As there are just six populations on SCNF and less than 2,000 individuals, this species is considered rare and the current abundance is low enough that stochastic and other factors could lead to potential imperilment (Rank A). Confidence in this rank is high as populations and potential habitat for this species have been surveyed.</p> <p>Confidence in Rank: <b>High</b>, Medium, or Low</p>	<p>Robert K. Moseley, Michael Mancuso and Steven L. Caicco. 1990. Field investigations of two sensitive plant species on the Salmon National Forest: <i>Phacelia lyallii</i> and <i>Physaria didymocarpa</i> var. <i>lyrata</i>. Internet website:  <a href="https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf">https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf</a>.            Accessed on September 22, 2017.</p>

Species (Scientific and Common Name): *Phacelia lyallii* (Lyll's phacelia)

Criteria	Rank	Rationale	Literature Citations
<p>5 Population Trend on the Salmon–Challis National Forest</p>	<p>D</p>	<p>The population trend for this species has not been studied. Surveys for this species in 1990 only re-visited one historic population. This population was found to consist of only three plants (Moseley 1990). With just six populations and approximately 2,000 individuals in total this species is vulnerable to threats inherent to small populations. There is no monitoring data for this species, therefore, there is not enough information to estimate population trends (Rank D).</p> <p>Confidence in Rank: <b>High</b>, Medium, or Low</p>	<p>Robert K. Moseley, Michael Mancuso and Steven L. Caicco. 1990. Field investigations of two sensitive plant species on the Salmon National Forest: <i>Phacelia lyallii</i> and <i>Physaria didymocarpa</i> var. <i>lyrata</i>. Internet website: <a href="https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf">https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf</a>. Accessed on September 22, 2017.</p>
<p>6 Habitat Trend on the Salmon–Challis National Forest</p>	<p>B</p>	<p>Habitat for this species consists of alpine scree and talus fields from 9,400 to 10,000 feet in elevation that are dry to mesic. Without exception, all populations occur on unstable, quartzite scree (Moseley et al. 1990). Protected, rocky alcoves, mostly in leeward positions, provide suitable conditions for populations to occur.</p> <p>Approximately 1.2% (~ 51,000 acres) of vegetation on the Forest is classified as alpine and 3% as barren-rock (~130,000 acres) (based on Landfire biophysical settings) (USFS 2017). On the SCNF, alpine plant communities tend to be dry and largely dominated by graminoids (Mancuso and Lehman 2016). Although these systems are rare and unique, they are well represented on the Forest (USFS 2017).</p> <p>Because alpine vegetation and barren rock mainly occur in designated wilderness, roadless, or remote areas where human interference disturbance is minimal, alpine communities of the Salmon–Challis are considered to exhibit good integrity and relatively stable (IDFG 2017b; USFS 2017). In 2016, Mancuso and Lehman resampled plots from a 1992 study on alpine community types on Sheep Mountain. Comparisons between the two dates indicate no substantial change in vegetative</p>	<p>Google Earth. 2017. Salmon–Challis National Forest, Idaho. Internet website: <a href="https://www.google.com/earth/">https://www.google.com/earth/</a>. Accessed on September 30, 2017.</p> <p>Idaho Department of Fish and Game. 2017. Idaho Fish and Wildlife Information System, Species Diversity Database, Idaho Natural Heritage Data. Accessed on February 27, 2017.</p> <p>IDFG (Idaho Department of Fish and Game). 2017. Idaho State Wildlife Action Plan, 2015. Boise ID.</p> <p>Mancuso, M., Lehman, R. 2016. Alpine plant community sampling and stewardship assessment in the Sheep Mountain Research Natural Area, Lemhi Mountains, Idaho. Caribou-Targhee National Forest, Idaho Falls, ID and Salmon-Challis National Forest,</p>

Species (Scientific and Common Name): *Phacelia lyallii* (Lyll's phacelia)

Criteria	Rank	Rationale	Literature Citations
		<p>composition or species represented in the intervening 24 years (Mancuso and Lehman 2016).</p> <p>Aerial imagery of habitat at each EO was assessed for ground disturbing activities. A database of existing grazing allotments on the Forest was also queried for allotments that overlapped known populations (IDFG 2017). A database review of known invasive plant populations was queried for populations near EOs (IDFG 2017). Another database of historical wildfires in the area was queried, as wildfires may degrade habitat (IDFG 2017). Notes from historical collections were also reviewed as they contain information on threats to habitat.</p> <p>Current and historical imagery around each of the EOs did not depict any significant ground disturbing activities (Google Earth 2017). The Loop Trail follows the Continental Divide around Element Occurrences 1, 6, 5, and 3. A hiking trail was also noted around EO 4.</p> <p>A database review of grazing allotments, invasive plant population locations, and wildfires found no indications that habitat for this species has been or is currently being impacted. An active grazing allotment occurs at EO 4, but the remaining populations did not occur in any grazing allotments. No invasive plant populations overlapped any EOs. None of the populations near wooded areas had wildfires recorded near them. A mine occurs near EO 3 and a two-track access trail was noted nearby. Threats from mining were noted on the Element Occurrence forms for EO 5 and EO 6.</p> <p>A review of aerial imagery and existing databases indicates that there are stable amounts of suitable or potential habitat (Rank B). Confidence in this rank is high as this species occupies habitat which is remote and</p>	<p>Salmon, ID.</p> <p>Robert K. Moseley, Michael Mancuso and Steven L. Caicco. 1990. Field investigations of two sensitive plant species on the Salmon National Forest: <i>Phacelia lyallii</i> and <i>Physaria didymocarpa</i> var. <i>lyrata</i>. Internet website: <a href="https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf">https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf</a>. Accessed on September 22, 2017.</p> <p>USFS (United States Department of Agriculture Forest Service). 2017. Salmon-Challis National Forest Plan Revision Assessments. Topics 1&amp; 2: Terrestrial Ecosystems, Aquatic Ecosystems, Watersheds, Air, Soil, Water.</p> <p>USFS. 2016. SDE RMU Range Allotments. GIS Database Information. Data source: S_R04_SCF.rmu_unit. Last updated March 30, 2016.</p>

Species (Scientific and Common Name): <i>Phacelia lyallii</i> (Lyall's phacelia)			
Criteria	Rank	Rationale	Literature Citations
		<p>isolated with few human-induced disturbances.</p> <p>Confidence in Rank: <b>High</b>, Medium, or Low</p>	
<p>7 Vulnerability of Habitats on the Salmon–Challis National Forest</p>	A	<p>Within the habitat for this species, the most significant drivers would likely be habitat alterations due to mining and/or recreational activity and changes in climate.</p> <p>Mining was noted at EOs 3, 5, and 6. The expansion of mining activities in the vicinity of <i>P. lyallii</i> populations has been cited as a threat to this species and its habitat (Moseley et al. 1990). The Forest is responsible for issuing mining permits which may impact <i>P. lyallii</i> populations and habitat.</p> <p>A hiking trail occurs near five of six EOs for this species, suggesting that it may be vulnerable to maintenance, further trail development, and/or increased recreational activity.</p> <p>Alpine habitat may be vulnerable to climatic factors and have low adaptive capacity to changes in climate. Changes in climate is expected to cause increasingly warmer and wetter conditions, with worsening summer drought, and alpine areas may transition from snow-dominated to rain-dominated (Halofsky et al. 2018; IDFG 2017). An extended growing season is projected to occur in the alpine which can result in interspecific competition for resources, changes in plant community composition and displacement of rare plant populations where they currently occupy specific niches. The amount of surface water flow and timing of peak runoff may also be impacted. Such changes may reduce the ranges of high-elevation species.</p> <p>Alpine systems are dependent on snowfields and gradual snowmelt to</p>	<p>Ash, J.D., Givnish, T.J., Waller, D.M. 2016. Tracking lags in historical plants species' shifts in relation to regional changes in climate. <i>Global Change Biology</i>, doi: 10.1111/gcb.13429.</p> <p>Behrens, P.N., R.E. Keane, D.L. Peterson, and J.J. Ho. 2018. Chapter 6: effects of climatic variability and change on forest vegetation. In Halofsky, J.E., D.L. Peterson, J.J. Ho, N.L. Little, L.A. Joyce, editors. 2018. <i>Changes in climate vulnerability and adaptation in the Intermountain Region</i>. Gen. Tech. Rep. RMRS-GTR-XXX. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Research Station.</p> <p>Dirnbock, T., F. Essl, and W. Rabitsch. 2011. Disproportional risk for habitat loss of high-altitude endemic species under changes in climate. <i>Global Change Biology</i>, 17:990-996.</p> <p>Halofsky, J.E., D.L. Peterson, J.J. Ho, N.L. Little, L.A. Joyce, editors. 2018. <i>Changes in climate vulnerability and adaptation in the Intermountain</i></p>

Species (Scientific and Common Name): *Phacelia lyallii* (Lyll's phacelia)

Criteria	Rank	Rationale	Literature Citations
		<p>maintain moisture for vegetation, and thus warming temperatures, increased drought, and changes in the depth and persistence of snowpack is projected to greatly affect this habitat in the Intermountain Region (Halofsky et al. 2018; IDFG 2017). While the extent of snowfields, as measured on April 1 and modeled under the RCP emissions scenario 8.5 (a severe scenario), is projected to remain similar on the Salmon-Challis into the 2080's, warmer conditions will markedly reduce their persistence and depth. In addition, losses will be greater than projected because this modeling provides an overestimate of precipitation at high elevations. This is because it uses the Global Climate Model (GCM), which does not account for local orographic effects (Halofsky et al. 2018).</p> <p>Summer precipitation is also very important for subalpine and alpine vegetative communities and the RCP 8.5 model projects a 20% decrease in summer precipitation for the SCNF. However, cooler soil temperature at higher elevation may moderate effects to alpine species (Halofsky et al. 2018).</p> <p>Some loss of alpine vegetation communities, especially mesic meadows, attributed to upslope migration of trees and shrubs may occur (Alexander et al. 2015 in Halofsky et al. 2018). Some, subalpine communities may have potential to migrate higher in elevation as a response to changing conditions, but this may be limited by underdeveloped soils at higher altitudes. Furthermore, the rate of climatic change in alpine communities may outpace the ability of species to shift their distribution (Ash et al. 2016; Dirnbock et al. 2011). Other communities may already exist at the highest elevations in the SCNF and, therefore, may have limited upward migration potential.</p> <p>Rare plant populations that may be small, isolated, tied to snowpack</p>	<p>Region. Gen. Tech. Rep. RMRS-GTR-xxx. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Research Station.</p> <p>Hatfield, R., Jepsen, S., Mader, E., Black, S.H., Shepherd, M. 2012. Conserving bumble bees: guidelines for creating and managing habitat for America's declining pollinators. The Xerces Society for Invertebrate Conservation.</p> <p>IDFG (Idaho Department of Fish and Game). 2017. Idaho State Wildlife Action Plan, 2015. Boise ID.</p> <p>Joyce, L.A. and M. Talbert. 2018. Chapter 3: Historical and projected climate. In Halofsky, J.E., D.L. Peterson, J.J. Ho, N.L. Little, L.A. Joyce, editors. 2018. Changes in climate vulnerability and adaptation in the Intermountain Region. Gen. Tech. Rep. RMRS-GTR-xxx. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Research Station.</p> <p>Miller-Struttman, N.E., Geib, J.C., Franklin, J.D., Kevan, P.G., Holdo, R.M., Ebert-May, D., Lynn, A.M., Kettenbach, J.A., Hedrick, E., Galen, C. 2015. Functional mismatch in a bumble bee</p>

Species (Scientific and Common Name): *Phacelia lyallii* (Lyll's phacelia)

Criteria	Rank	Rationale	Literature Citations
		<p>abundance and distribution timing changes of spring thaw and fall frost cycles, and/or have limited dispersal capacity, are highly vulnerable to impacts from environmental change including reductions in pollination.</p> <p>Changes in temperature and precipitation may also lead to greater variability in forb flowering, which could create an asynchronistic effect with native pollinator emergence (Halofsky et al. 2018; Miller-Struttmann et al. 2015), leading to decreased reproduction in native plants. As pollinators are critical for successful reproduction and seed set for approximately 85% of flowering species globally (Hatfield et al. 2012), this asynchronistic effect may have profound implications.</p> <p>Alpine vegetation communities are considered exceptionally vulnerable to anthropogenic disturbances including impacts from herbivory/trampling by native ungulates and/or unmanaged livestock grazing, infrastructure development (trails and com sites), increased recreational activities at high elevation sites, and associated trampling. Given potential changes and stressors in alpine communities with regard to climate, it is assumed that the impacts of anthropogenic disturbances may be an additional threat to alpine species.</p> <p>The degree to which both populations and habitats are vulnerable to loss or disturbance on the Forest are dependent upon variability in severity of impacts from changes in climate and habitat modification decisions (Rank B).</p> <p>Confidence in Rank: <b>High</b>, Medium, or Low</p>	<p>pollination mutualism under changes in climate. Science, 349(6255): 1541-1544.</p> <p>Robert K. Moseley, Michael Mancuso and Steven L. Caicco. 1990. Field investigations of two sensitive plant species on the Salmon National Forest: <i>Phacelia lyallii</i> and <i>Physaria didymocarpa</i> var. <i>lyrata</i>. Internet website:  <a href="https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf">https://fishandgame.idaho.gov/ifwis/dnhp/cdc_pdf/moser90h.pdf</a>.            Accessed on September 22, 2017.</p>

Species (Scientific and Common Name): *Phacelia lyallii* (Lyll's phacelia)

Criteria	Rank	Rationale	Literature Citations
<p>8 Life History and Demographics</p>	<p>A</p>	<p>Life history factors such as lifespan, seed dispersal strategy, variation in germination rates, relationship with pollination agents, and susceptibility to herbivory are characteristics that can affect viability in plants.</p> <p><i>P. lyallii</i> is a perennial species with a reproductive strategy that has not been well studied. The seed dispersal strategy is unknown but may use abiotic mechanisms such as water from rain or snow, wind or gravity. Likewise, germination rates and pollinator relationships are unknown. There are no accounts of this species being grazed by domestic or wild ungulates.</p> <p>The demographics of this species are not well known. Two populations are known from 15 or fewer individuals. Three other populations are noted as being 'common' or having 100 to 1,000 individuals. The two populations with 3 to 15 individuals would likely be susceptible to local extinctions from a stochastic event. The presence of just six occurrences on the Forest may also leave this species vulnerable to threats associated with a limited gene pool including genetic drift and inbreeding depression leading to reduced fitness.</p> <p>The number and size of populations of this species on the Forest could indicate that this species would not recover rapidly from disturbance events (Rank A). Confidence in this rank is medium as little is known of the reproductive biology of this species and population size is variable.</p> <p>Confidence in Rank: High, <b>Medium</b>, or Low</p>	<p>Consortium of Pacific Northwest Herbaria (CPNWH). 2017. <i>Phacelia lyallii</i>. Internet website: <a href="http://www.pnwherbaria.org/data/results.php?DisplayAs=WebPage&amp;ExcludeCultivated=Y&amp;GroupBy=ungrouped&amp;SortBy=Year&amp;SortOrder=DESC&amp;SearchAllHerbaria=Y&amp;QueryCount=1&amp;IncludeSynonyms1=Y&amp;Genus1=phacelia&amp;Species1=lyallii&amp;Zoom=4&amp;Lat=55&amp;Lng=-135&amp;PolygonCount=0">http://www.pnwherbaria.org/data/results.php?DisplayAs=WebPage&amp;ExcludeCultivated=Y&amp;GroupBy=ungrouped&amp;SortBy=Year&amp;SortOrder=DESC&amp;SearchAllHerbaria=Y&amp;QueryCount=1&amp;IncludeSynonyms1=Y&amp;Genus1=phacelia&amp;Species1=lyallii&amp;Zoom=4&amp;Lat=55&amp;Lng=-135&amp;PolygonCount=0</a>. Accessed on September 22, 2017.</p>
<p><b>Summary and recommendations:</b> <i>P. lyallii</i> is consider vulnerable globally and imperiled in Idaho. Surveys for this species indicate that it is known from six occurrences and fewer than 2,000 individuals on the Forest. This suggests that the species is susceptible to stochastic events and decreased genetic fitness on the Forest.</p>			<p>Date: October 2, 2017</p>

Species (Scientific and Common Name): ***Phacelia lyallii* (Lyll's phacelia)**

Criteria	Rank	Rationale	Literature Citations
		<p>More research is needed regarding the life history or seed dispersal mechanisms of the species, although it is assumed that the reproductive rate is low. <i>P. lyallii</i> population trends on the SCNF have not been monitored consistently and no population trend data is available. This species occupies rocky alpine habitats in remote and isolated areas along the Continental Divide. Alpine communities are generally considered stable on the SCNF, but are considered exceptionally vulnerable to long-term threats related to changes in climate compared to other vegetative communities. Mining is known to occur in the area and is cited on three EOs as a direct threat to some populations. A number of EOs occur near the Continental Divide hiking trail and may be threatened by unmanaged recreational activity and/or heavy maintenance or expansion on the trail.</p> <p>There is substantial concern for the capability of <i>Phacelia lyallii</i> to persist over the long-term on the Salmon-Challis, therefore, it is recommended as a SCC.</p> <p>Evaluator(s): Dan Morta</p>	